Spot Safety Project Evaluation

Project Log # 200610100

Spot Safety Project # 08-01-207

Spot Safety Project Evaluation of the Traffic Signal Installation at US 1-15-501 and SR 1334 and Relocating SR 1333 in Lee County

Documents Prepared By:

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Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 08-01-207 – Traffic Signal Installation at US 1-15-501 and SR 1334 and Relocating SR 1333 in Lee County.

Project Information and Background from the Project File Folder

US 1-15-501 is a five lane divided roadway with three southbound lanes and two northbound lanes. The southbound direction has a dedicated right turn lane and the northbound direction has a dedicated left turn lane. The speed limit on US 1-15-501 is 55 mph on the northern side of intersection with SR 1334 and 45 mph on the southern side of the intersection. SR 1334 is a two lane roadway with a speed limit of 55 mph and a dedicated right turn lane added in the after period.

The original problem statement shows there was a pattern of angle crashes at the intersection. There were 7 total and 6 correctable (frontal type) reported crashes at the intersection from 12/31/1997 through 12/31/2000. The improvement chosen for the subject location was to install a traffic signal and relocate service road SR 1333. The final completion date for the improvement at the subject location was on August 23, 2002 at a cost of $45,000.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes along the subject road, the crash data omitted from this analysis to consider for an adequate construction period was from July 2002 through September 2002. The before period consisted of reported crashes from July 1, 1998 through June 30, 2002 (4 years) and the after period consisted of reported crashes from October 1, 2002 through September 30, 2006 (4 years). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes within 150 feet of the subject intersection. The following data table depicts the Naive Before and After Analysis for the above information. Please note that Frontal Impact crash types were the target crashes for the applied countermeasure. These crash types considered are as follows: Left Turn, same roadway; Left Turn, different roadway; Right Turn, same roadway; Right Turn, different roadway; Head On and Angle.

Treatment Information	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	12	25	108.3
Total Severity Index	4.1	7.6	85.7
Frontal Impact Crashes	7	14	100.0
Frontal Severity Index	6.3	9.1	44.1
Volume	24250	25800	6.4
Treatment Injury Crashes	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal	0	0	N/A
Class A	0	1	N/A
Class B	2	0	-100.0
Class C	3	12	300.0
Property Damage Only	7	12	71.4
Frontal Injury Crashes	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal	0	0	N/A
Class A	0	1	N/A
Class B	2	0	-100.0
Class C	3	5	66.7
Property Damage Only	2	8	300.0

Table 1.

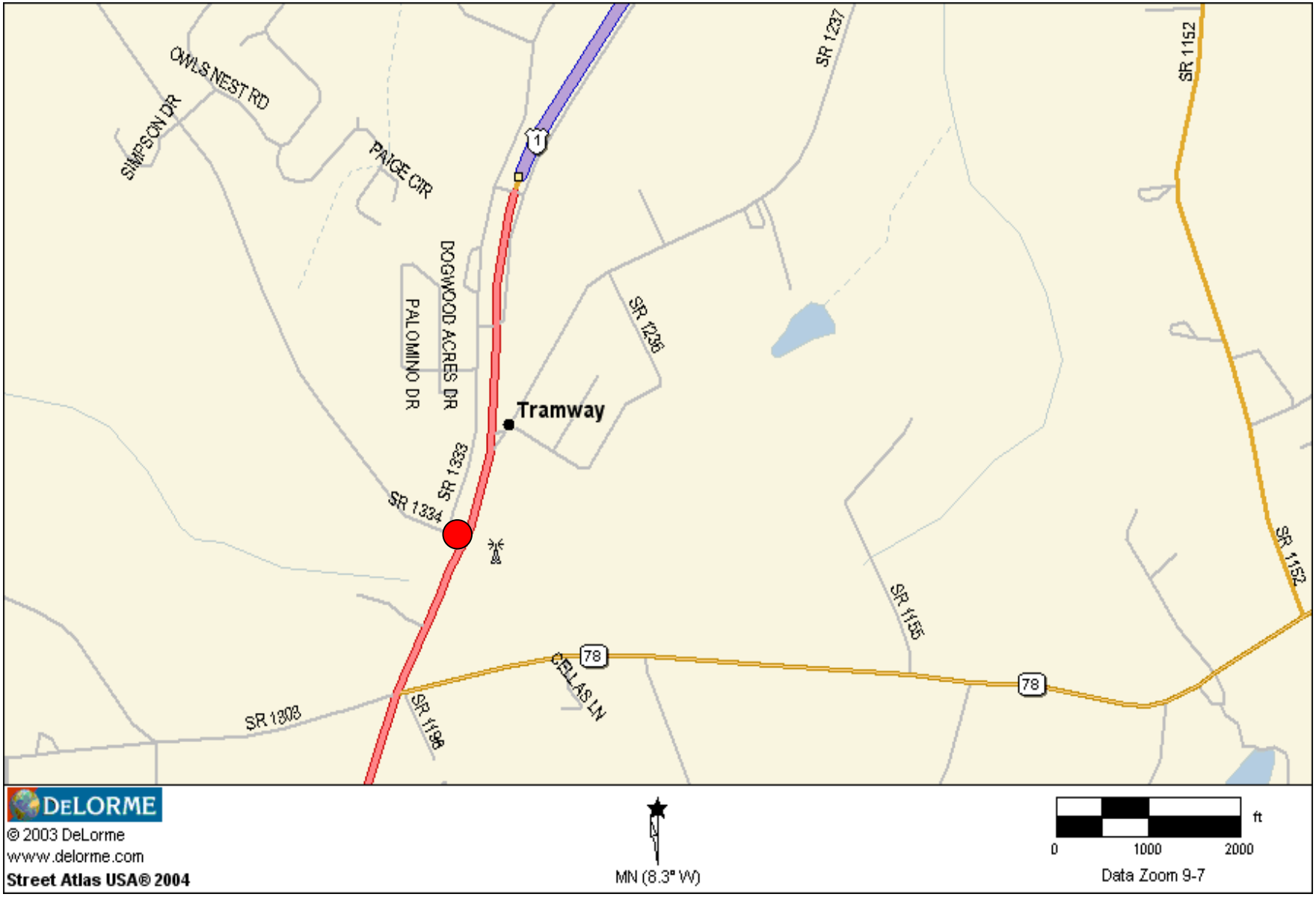
The naive before and after analysis at the treatment location resulted in a 108 percent increase in Total Crashes, a 100 percent increase in Frontal Impact Crashes, and a 6 percent increase in Average Daily Traffic (ADT). The before period ADT year was 2000 and the after period ADT year was 2004.

Results and Discussion

The naïve before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 108 percent increase in Total Crashes and a 100 percent increase in Frontal Impact Crashes. The summary results above demonstrate that the treatment location appears to have had an increase in the number of Total Crashes and an increase in the number of Frontal Impact Crashes from the before to the after period.

The data shows an increase in total crashes and frontal impacts as well as their respective severity. During the field investigation there were no near misses noticed or any hesitations by drivers. The only issue seen was that US 1-15-501 southbound is at a slightly higher elevation than the northbound side (see Photos). Referencing the After Period collision diagram, there is a pattern of seven left turn crashes between southbound thru traffic and northbound left turning traffic. From the seven left turn crashes, the crash reports show there were 4 "failure to yield" by the left turning vehicle, 1 "red light" violation by the southbound thru vehicle, and 2 undeterminable crashes. The elevation difference may be a sight distance issue when attempting a left turn during the permitted phase. Switching to a protected only phase for the northbound turning traffic may reduce any adverse effects sight distance may have.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of road.



Location Map: US 1-15-501 and SR 1334 (Pendergrass Road).

Treatment Site Photos taken January 25, 2007

Traveling east on SR 1334

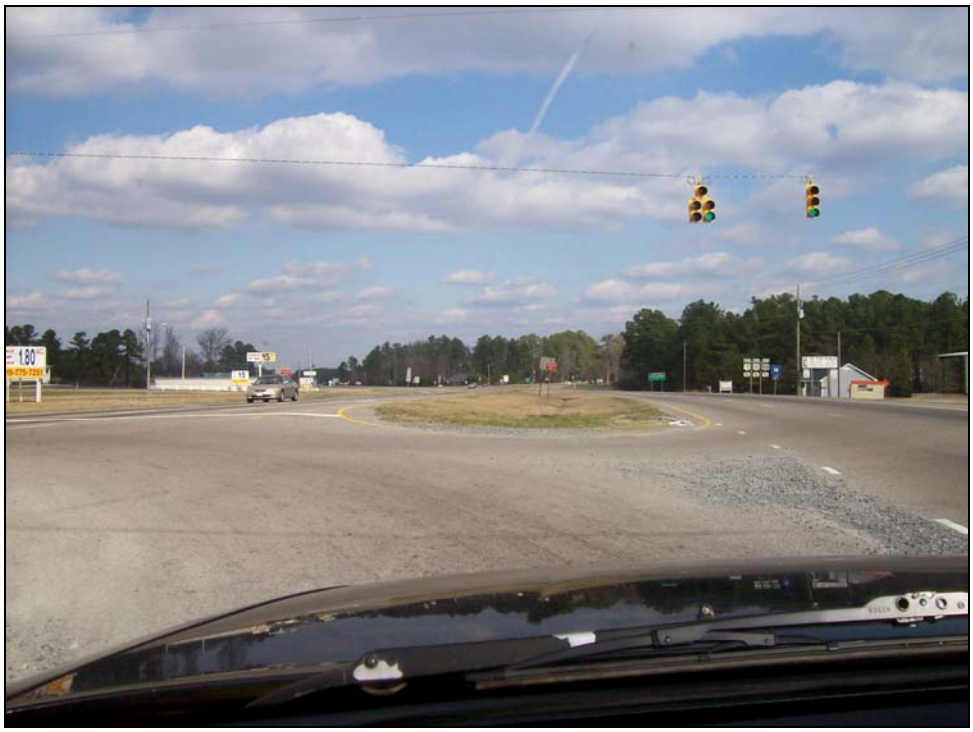
On SR 1334 looking north

Traveling north on US 1-15-501

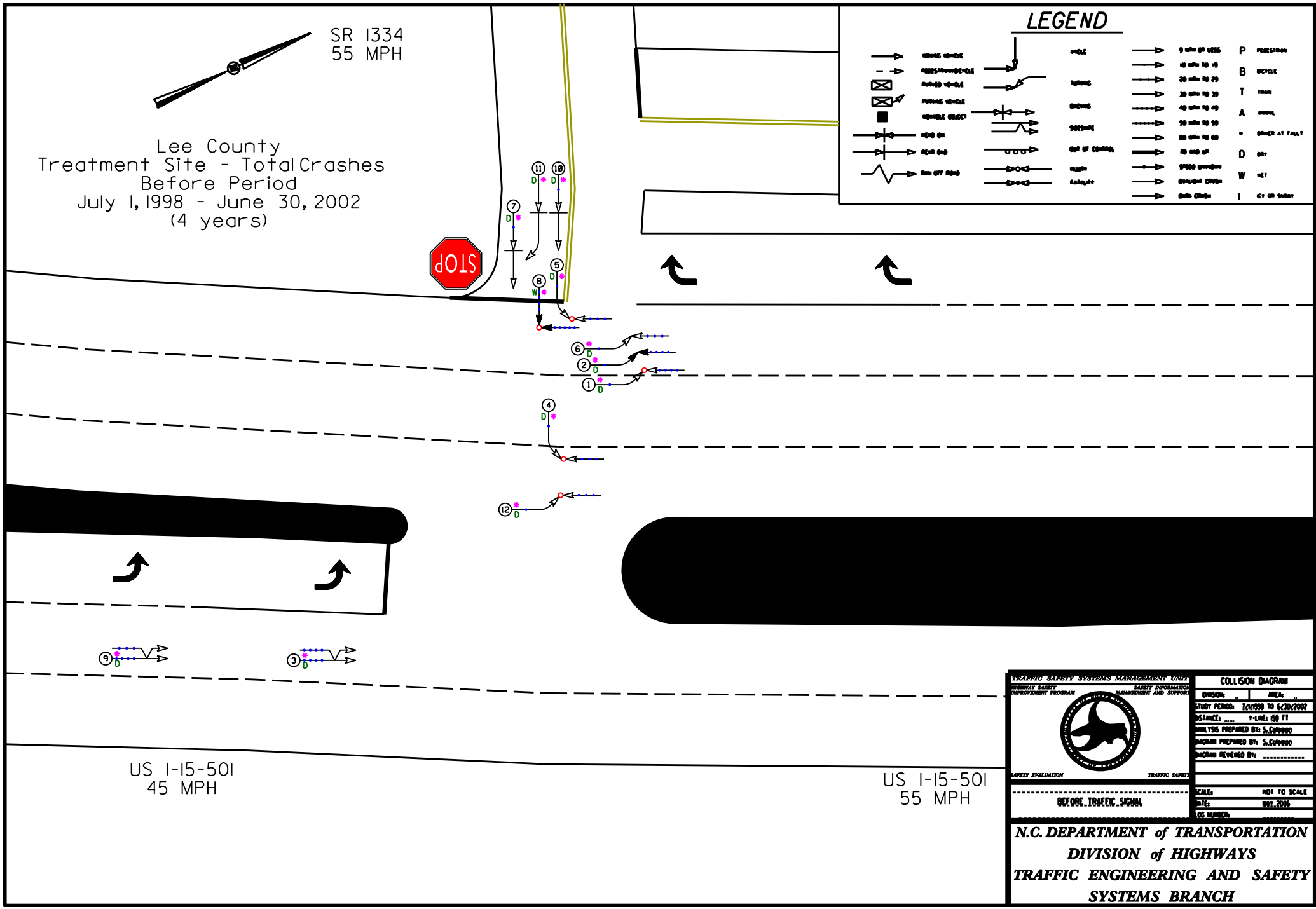
Traveling north on US 1-15-501

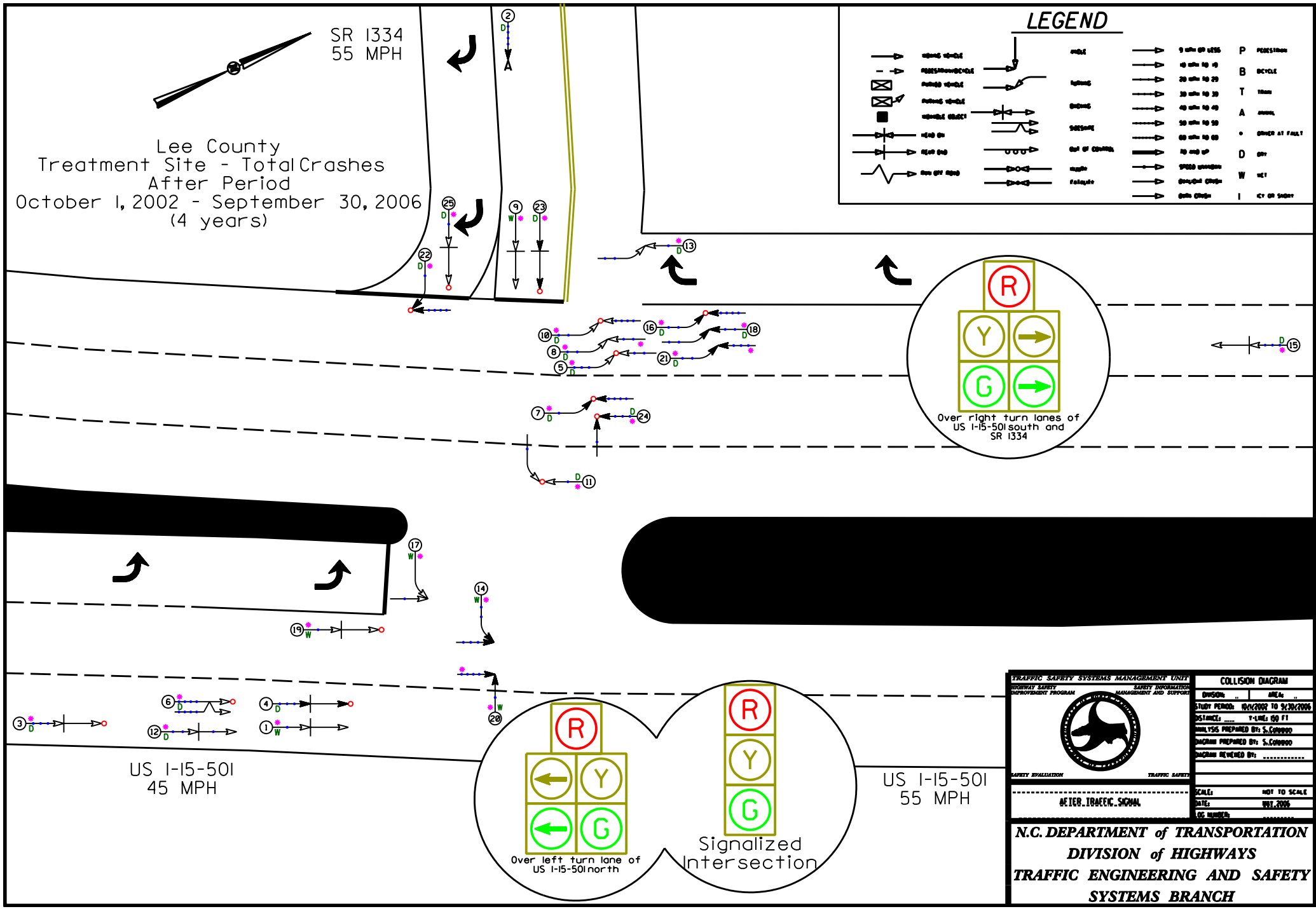
Traveling south on US 1-15-501

Traveling south on US 1-15-501



On US 1-15-501 north in the left turn lane


SR 1334
55 MPH
Lee County
Treatment Site - Total Crashes
Before Period
July 1, 1998 - June 30, 2002
(4 years)
LEGEND
STOP
US 1-15-501
45 MPH
US 1-15-501
55 MPH
TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT
HIGHWAY SAFETY IMPROVEMENT PROGRAM
SAFETY INFORMATION MANAGEMENT AND SUPPORT
SAFETY EVALUATION
TRAFFIC SAFETY
BEFORE TRAFFIC SIGNAL
COLLISION DIAGRAM
STUDY PERIOD: 7/1/1998 TO 6/30/2002
SCALE: NOT TO SCALE
DATE: MAY 2006
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH


SR 1334
55 MPH
Lee County
Treatment Site - Total Crashes
After Period
October 1, 2002 - September 30, 2006
(4 years)
LEGEND
Over right turn lanes of
US I-15-501 south and
SR 1334
US I-15-501
45 MPH
US I-15-501
55 MPH
Over left turn lane of
US I-15-501 north
Signalized
Intersection
TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT
COLLISION DIAGRAM
AFTER_TRAFFIC_SIGNAL
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH